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Electronic Reference Options: Tracking the Changes.

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Abstract:
A survey of 96 academic libraries belonging to the Association of Research Libraries reveals that the popularity of the four primary electronic reference mediums - online public access catalogs (OPACs), CD-ROM, end-user online and intermediary online - increased between 1991 and 1994. All the libraries provide CD-ROM access. Ninety-five provide intermediary online searching; 63, end-user online searching; and 71, tape loaded databases through OPACs.

Full Text:
If you visit the reference department of any academic research library in the United States or Canada, you see electronic reference services at work. Shelves of printed almanacs, directories, atlases and even a few abstracts/indexes compete for space with OPAC terminals, networked banks of CD-ROM workstations, standalone multimedia computers, computer-assisted tutorial stations and online search service access points. Often some of the OPAC terminals are fully integrated workstations that allow textual and graphical access to many information resources. In most cases you don't even have to physically "walk in" to the library - much of the collection is accessible virtually through a complex array of cross-campus networks and on a dial-in basis.

In 1994, we surveyed the academic library members of the Association of Research Libraries (ARL) to discover what types of electronic reference services they offer and how these services affect reference librarians' jobs and user and staff training. This survey was a follow-up of a survey we did in 1991 that was published in ONLINE in 1992[1,2].

In the three years between our surveys, academic research libraries have added more CD-ROMs, loaded more databases locally, expanded their end-user online search services, and incorporated Internet access for library patrons. More importantly, perhaps, most librarians who responded say they have learned to anticipate adding new electronic options and are continually improving access means and instruction for students and faculty. Electronic reference has been fully integrated into reference work in most of these libraries.

THE SURVEY

The Association of Research Libraries includes 121 member libraries that share a common mission to serve faculty, students and researchers and provide access to the information required by the research community. Most ARL member libraries are in large universities, although ARL has a few nonacademic libraries, including the Smithsonian, the National Library of Canada, the Library of Congress, the National Library of Medicine and the National Agricultural Library, and a few non-library members, including the Center for Research Libraries, the Association of College and Research Libraries and ARL itself.

In our 1991 survey we sent questionnaires to all ARL libraries (119 at the time). Ninety-six libraries responded, for a return rate of 81 percent. Most libraries that did not respond were nonacademic libraries or nonlibrary members. This time we sent questionnaires to just the 113 academic library members. Again 96 libraries responded for a return rate of 85 percent. Almost all the libraries that answered in 1994 are the same that answered in 1991, allowing us to draw meaningful comparisons over time.

Most of the survey parallels the earlier survey, including questions about locally loaded databases, CD-ROM, intermediary online search services and end-user online searching. In addition, we asked many questions about Internet access because we suspected this has had a major impact recently on reference services. Factual information was supplemented with predictions for the future, and open-ended comments on how the jobs of reference staff have changed. (The survey is posted as an appendix to this article on the Online Inc. gopher at online.lib.uic.edu. - NG)

Some respondents indicated a willingness to be interviewed and were contacted by phone or via e-mail for further information. We asked them in particular about how they have incorporated patron access to the Internet into library services and how they accomplish training of staff and users. (See these questions also on the gopher. - NG)

The respondents are large universities for the most part - over half (55 of 91 respondents) serve 20,000 or more students and 80 serve at least 10,000 students. Most have more than one branch library on their main campus (89 of 95), with 11 or more branch libraries in 31 of 95 campuses. ARL libraries typically have large budgets, but like most libraries, budgets have not been increasing in actual buying power for many years.

ELECTRONIC OPTIONS:

1991 TO 1994

Electronic access to information is a high priority in these libraries. Only two of the 96 libraries do not have an online public access catalog, a number that has not changed since 1991. Most have many terminals or workstations - more than half of the libraries with OPACS have more than 100 terminals (Figure 1).

All the libraries with OPACs allow access to them from outside the library. Outside access is widely available from many places-through dial-up (98 percent), from faculty offices (87.5 percent), from elsewhere on campus (89.6 percent), and from dorms (74 percent).

The four main electronic reference options (tape loaded/available through the OPAC, CD-ROM, end-user online and intermediary online) have grown in popularity since 1991. Figure 2 shows how access to all of these options has increased between 1991 and 1994. All the libraries now offer patron access to CD-ROM databases. Ninety-five of 96 libraries offer intermediary online searching (one did not respond), 63 offer end-user online searching, and 71 offer tape loaded databases through their OPACs. In addition, patron access to the Internet is the newest popular service in university libraries - 74 libraries now provide patron access to the Internet.

Patron access to the Internet was added by over three-quarters of the university libraries in just a three-year period. This rapid growth demonstrates both the potential and value of Internet resources, and the willingness of university libraries to add new services quickly.

After the Internet, tape loading was the option added by the greatest number of libraries. Now 74 percent of libraries offer tape-loaded databases. Although this is a big jump from the 36 percent that offered them three years before, it is actually a smaller increase than predicted by the libraries themselves. In 1991, 48 percent of the libraries that did not tape load indicated they planned to add the service - in reality only 38 percent did so.

On the other hand, the increase in libraries offering end-user online access is greater than forecast. The jump from 45 percent to 66 percent of libraries is greater than the 14 percent of libraries that planned to add end-user online searching. Perhaps some libraries that were planning to tape load decided to take advantage of databases available on commercial online search services instead.

In 1994, over half the libraries planned to add services or add to the options they offered. Only three anticipated discontinuing any services. One planned to eliminate intermediary online and two planned to eliminate tape loading.

ELECTRONIC OPTIONS

For each electronic option, we asked some more detailed questions about databases offered or pricing policies.

CD-ROM

All libraries offer CD-ROM access, and nearly all offer multiple titles. Figure 3 shows that over half the libraries that answered this question now have more than 60 CD-ROM titles, with 33 percent offering over 100 titles. This is a big increase since 1991, when only 35.4 percent of libraries had more than 30 titles.

CD-ROM databases are available on multiple workstations throughout the library or branch libraries on campus. Thirty-two of 92 respondents have more than 30 workstations. All but six libraries have more than ten workstations. Some CD-ROM databases are offered on standalone workstations, but 75 percent of the libraries have CD-ROM local area networks (up from 38 percent in 1991). Dial-up access to CD-ROM databases was new in 1991 - only six libraries had the capability. Today it is still not common, but has increased to 21 libraries (22 percent).

Intermediary Online

Virtually all libraries still offer intermediary online search services, defined as where a librarian or other professional searcher does the online searching for patrons. Almost all libraries still charge for this service - 57 percent charge all users and 37.5 percent charge some users.

As in 1991, DIALOG is the search service most frequently offered by library intermediary search services. All the libraries that indicated they offer intermediary online (95) use DIALOG. As Figure 4 shows, many other systems are offered as well, and most libraries use multiple systems in their intermediary search services. LEXIS-NEXIS, WESTLAW and Data-Star have increased in popularity, while use of BRS (now CDP Online) and Wilsonline have decreased markedly. The percentage of libraries that offer other popular systems has remained about the same.

End-User Online

The number of libraries offering end-user online searching (66 percent) increased even more than predicted by the libraries in 1991. As we found in the earlier survey, libraries are using a variety of systems for end-user searching. The one big change, and we suspect the main reason end-user online searching has become more common, is the entry of OCLC/FirstSearch into the end-user online market.

FirstSearch has made it easy for libraries to offer end-user searching. Libraries can allow users to search with the FirstSearch menus or they may offer FirstSearch through their OPAC interface. The choice of subscription or per-search pricing and "self-destruct" passwords makes it easy for libraries to control end-user online costs and security.

More than 35 percent of ARL academic libraries offer FirstSearch, making it the most popular end-user online option. Many other most popular systems are aimed at specialized audiences, including LEXIS-NEXIS (law), STN International (chemistry), WESTLAW (law) and National Library of Medicine MEDLARS system (health sciences).

In comparison to FirstSearch, no other multiple-subject "supermarket" system comes close in popularity, but BRS/After Dark, Dow Jones News/Retrieval, and DIALOG's Knowledge Index were all mentioned by 11 or more libraries (Figure 5). Since both BRS/After Dark and DIALOG's Knowledge Index had changes in ownership and terms of use in 1994, their popularity in libraries may now be lower than these figures indicate. Other systems mentioned include RLG's Eureka and CARL's UnCover.

Only 11.5 percent charge all end-users, while an additional 23 percent charge some end-users. This combined 34.5 percent of libraries that charge some or all of their end-user online searchers is down from the 57.5 percent of libraries that charged in 1991. Although we did not ask, we suspect that the decrease in the number of libraries charging will cause a concomitant increase in the amount this service is used.

Tape-Loaded Databases

Nearly three-quarters (74 percent) of the libraries have tape-loaded reference databases available through their OPAC software. Often these are loaded at the host library (locally loaded). In other cases they are loaded at another library or another remote site and offered through a sharing or consortium arrangement. These consortia are usually libraries that share a common OPAC vendor and have arranged multiple-site tape leases, i.e., CARL libraries or MELVYL libraries.

Eighty-seven libraries load tapes locally - 50 access tape-loaded databases through their OPAC software that are loaded at a remote site. We did not ask for specific titles loaded locally, but most libraries load bibliographic databases (51 percent). Full-text (23 percent) and directory (17.7 percent) databases are popular as well. Only eight libraries indicated that they are loading image databases (presumably full text). We expect this number will increase in the future.

Patron Access to the Internet

A major change recently in many libraries is the widespread popularity of the Internet. Patron access to the Internet is the newest reference service to be supported in most academic research libraries, and has been enthusiastically embraced by research librarians. As of 1994, 77 percent offer patron access to the Internet. Of the 74 libraries that now offer Internet access, most extend access to undergraduates (93 percent), faculty (95 percent), graduate students (95 percent) and community users (68 percent).

Only 35 percent of the libraries provide Internet access through their OPAC terminals, and 53 percent have dedicated terminals or workstations. More provide access only in the library, but about half (51 percent) support dial-in access.

A variety of types of Internet access are offered to patrons (Figure 6). Local gophers are common (56 of 72 libraries) and are an important factor in making access easier. More libraries are also adding access via World-Wide Web browsers such as Mosaic. A recent Library Journal survey found that 20 percent of libraries use graphical browsers like Mosaic[4].

E-mail access for patrons is supported by 27 libraries, but not all are planning to continue it. Several libraries mentioned that e-mail ties up terminals that would be better used by people who needed access to information sources. Telnetting to information sources, either directly, through a local gopher, or through scripted menus is offered by many libraries.

In addition to (or instead of) patron access, most libraries use the Internet for reference work (86 percent of all libraries). They use it most commonly for ready reference (74 percent) and e-mail reference (56 percent). Other uses include remote database access, research consultation and access to other library catalogs.

User education and training is an important traditional role of academic research libraries. This has become even more important with new services, as we discovered in our earlier survey. Instruction librarians now teach access means and computerized information basics in addition to sources and content.

Seventy libraries offer Internet training in the library, using a variety of techniques. One-on-one instruction is most common (53 libraries), but group instruction as part of regular library instruction (48 libraries) or in special Internet classes (48 libraries) is offered as well. Printed guides are created by 49 libraries. Surprisingly, none of the respondents are as yet using computer-assisted instruction or videotapes to teach Internet access, although they use them for other instructional topics.

Only 28 libraries provide Internet training for remote users. Techniques used include printed guides (18 libraries), one-on-one instruction via telephone (15), special Internet group classes (13), and e-mail or online instruction (10).

IMPACT OF ELECTRONIC

REFERENCE SERVICES

To supplement the factual information, we gathered written comments from the respondents on how their library's use of electronic reference services has changed over the past two or three years and how the job of the reference staff has changed. These comments can be grouped in five main categories:

1) Interplay of options (how one electronic reference option impacts another)

2) Changes in instruction duties or methods

3) Impact on the workload and tasks of library staff

4) Changes in attitudes of library staff and patrons

5) Integration of services

Interplay of Options

Consistent with our findings in 1991, few libraries eliminate a reference option when they add a new one, but many see an increase or decrease in the use of one option when they add another. Intermediary online searching has seen a marked decrease in many academic research libraries. CD-ROM, end-user online and tape-loaded database searching have replaced much of the intermediary online searching.

A more recent change may be the move away from CD-ROM and locally loaded tapes to end-user online. One librarian commented, "Two to three years ago we were eagerly making decisions about CD-ROMs and locally loaded databases. Now our approach favors remote access whenever practical." Remote access includes public access to the Internet and commercial online systems aimed at end-users.

End-user online is price-sensitive, however. "End-user online has increased for certain flat-fee services, but pay-per-search services are not heavily utilized."

Although we did not specifically ask about printed reference materials, some respondents volunteered that the increasing reliance on electronic resources of all types has led to less reliance on print. In our earlier survey, librarians commented on patrons' overwhelming preference for free electronic resources over print, and this has continued, in all types of libraries. "Most patrons prefer using electronic databases and will queue up rather than use the same sources in paper format."

Rather than duplicate sources, "some print editions of reference tools have been and will be canceled" in some libraries. In others, "all the electronic services have been added on to more traditional services and very little of the old has been dropped."

Changes in Instruction

Even with greater reliance on remote access, most university librarians say they are spending more time on instruction. There is a demand for instruction in how to use the various online services, the Internet and CD-ROM systems from both students and faculty. "Bibliographic instruction demands have increased as faculty have become aware of new electronic sources in various disciplines and want their students to utilize them."

As discussed earlier, the approach to instruction varies. Most offer group instruction, but some incorporate technology into subject classes; others offer group courses on a specific technology or source. One librarian commented, "More need of instruction on complicated computer databases has created a need for more group instruction on specific sources rather than for classes on general research sources in an area."

Many have begun to segment classes into small pieces. Rather than a class on using the Internet, for example, they may teach one class on Mosaic, another on using gophers, another on FTP, etc. Some offer these technology-focused classes in addition to subject oriented classes that incorporate electronic sources.

The need for one-on-one instruction has grown so much that many libraries have reorganized staffing patterns. "Roving reference librarians" offer help to users of dozens of workstations throughout reference areas. In some universities, librarians rove even further. "We get out of the library and into offices and laboratories to do one-on-one training on-site, while providing a high level of service in the physical library space at the same time. Generally, our goal is to be more nimble!"

Team teaching, most often with the computing center, is happening in many universities. Internet training in particular seems to benefit from the team approach. The need to teach technical details of connecting and configuring hardware has caused some libraries to form these partnerships for instruction.

In addition, many librarians are developing computer-assisted instruction modules for a variety of systems and sources. They are using HyperCard, expert systems and other approaches to develop instructional materials.

Impact on Workload and Tasks

Many of the comments about instruction are related to increased workloads or a reprioritization of librarians' time. Impact on overall workloads, not just on instructional duties were noted by many librarians as well. New duties or emphases include knowledge and care and feeding of software, communications lines and hardware.

Many commented on the growing complexity of the reference librarian's job. "The job of the reference staff now includes learning multiple interfaces for a variety of CD-ROM products, learning the convoluted workings of the Internet and integrating them into the reference environment, checking for and answering queries that come in over e-mail (in addition to in-person, telephone and snail mail inquiries), instructing patrons on the use of and interpretation of the electronic retrieval systems."

"There is an additional responsibility for the staff to set up and maintain workstations effectively, as well as learning the interfaces and understanding the search engines of a variety of products."

"Reference now needs to understand PC hardware to some degree. When a new CD-ROM arrives, staff have to mount the new disc. This is more involved than removing an old book index from the shelves and putting the new index in its place."

Many libraries mentioned they have set up task forces or electronic database committees that evaluate sources, examine opportunities for integration, and look at the big picture. The reference department is more integrated with other units in the library so "we spend an increasing amount of time and effort in library system-wide planning to accommodate the larger array of new technologies, in maintaining the hardware and software to support these resources, in budgeting for them, in space planning and even in designing new electronic resources."

New job titles such as Coordinator of Electronic Resources, Staff Training Specialist and Internet Training Team are a direct outgrowth of increasingly complex electronic environments.

Reorganization of reference departments or realignment of responsibilities is not uncommon. One library reports, "The two reference departments in the main library have both created auxiliary electronic reference units within the departments. We have had to find additional staff to assist in these areas at peak times when the staff at the reference service points have been unable to do so."

Support staff may be added to take over some of the tasks generated by reliance on electronic products. Changing ink cartridges, refilling paper trays, fixing paper jams, and other hardware troubleshooting tasks are only a few of these. Support staff help users cope with the variety of sources, interfaces and search engines. "We have added support staff to provide supervision of electronic reference centers, freeing librarians to advise on substance rather than protocol." "What used to be a librarian and desk-centered service is now a multilayered service with students and support staff providing an introductory level of service, and the librarians an instructional and consultative level with the service location being anywhere."

Librarians spend more time "developing electronic information services such as the CD-ROM network, a locally-mounted gopher, electronic journal archives and a data library." Several libraries said librarians spend more time on more complex collection development duties.

Changes in Attitudes

Attitudes of library users have changed in the last few years. Many changes are related to rising expectations which, although they may be unrealistic at times, are for the most part positive. One librarian commented, "Electronic access has made life at the reference desk more complex, open to a wider base of customers, and has brought on a culture where the promise of instant access brings on the demand for instant gratification, no matter what the request."

Another said, "Users look to librarians to assist them in analyzing and synthesizing their information in various electronic formats such as e-mail, on disk, or point the person to the proper online catalog, bulletin board, discussion group, etc. via the Internet."

The increase in levels of patron expectations led one librarian to comment, "The demands and expectations of patrons make one wonder how well we were responding to patrons in the paper environment." Another expressed the opinion, "I do not feel that the job of reference staff has changed significantly; we simply have new tools for doing the job of providing information."

More than one library reported, "Reference librarians talk more of `burnout.'" Another said, "Much of it is exciting, but we're seeing burnout, and shortened tempers more often than in the past two years." More see a balance in attitudes such as "reference staff occasionally feel overwhelmed by the mass of electronic data, but also excited by its possibilities," or "constant change is difficult, but the only thing we can count on."

Integration of Services

There is no doubt that university libraries have incorporated reference services into traditional reference functions, where "confluence is the trend." The goal of many libraries is complete integration. "Over the past two or three years, electronic resources have become more and more a regular part of reference service. Computer workstations have replaced the card catalog and print indexes as the focal point of the reference area, and no bibliographic instruction session is complete without a demo of some electronic source(s). As the cost of high-powered PCs drops, I expect this integration to continue, moving toward the `scholar's workstation' model."

Few librarians want to return to an old-fashioned model, even with the current pressure to learn new things at a constant, and given

almost daily changes. As one librarian summarized, "The `wear and tear' on library staff has been great, but the patron impact is worth it. These electronic resources are the first resort for patrons and staff, and their use has become integral to reference work."

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